



TECHNICAL BULLETIN

TB-G001

Date: February 2, 2005

Scope: Tranquility Ultratech Modulation Verification Procedure
Copeland Compressor Production September – December 2004
Serial Number Range 04I – 04L

This procedure should be used to verify the performance of compressors that have been installed and operating for a period time and still have questionable shifting performance. Please contact ClimateMaster Technical Support prior to compressor replacement in order to coordinate findings and return of compressor to Copeland.

- a) Disconnect power from the unit.
- b) Disconnect Y2 thermostat wire from ICM interface board.
- c) Jumper Y2 thermostat connection to Y1 on ICM interface board.
- d) Set thermostat set point to high setting in heating or low setting in cooling to assure that the unit starts.
- e) Reconnect power to unit. This will start the compressor in high capacity mode.
- f) Run unit for at least 15 minutes or until pressures stabilizes. Record unit pressures and compressor amperage.
- g) Remove jumper between Y2 and Y1 to shift compressor to low capacity.
- h) Run unit for at least 15 minutes or until pressures stabilize. Record unit pressures and compressor amperage.
- i) Subtract low amperage from high amperage and record.
- j) Look up both high and low amperage at the recorded unit pressures on the Compressor Amperage Tables. Subtract low table amperage from high table amperage, compare to results from step i. The measured amperage difference should agree within +/- 10% to the amperage difference from the tables. Amperage difference is used to eliminate meter error.
- k) Replace jumper from Y2 back to Y1 to shift the compressor back to high capacity mode.
- l) Run unit for at least 15 minutes or until pressures stabilizes. Record unit pressures and compressor amperage.
- m) Compare full capacity amp draw from step "l" to step "f". These two amp draws should be identical with a possible small variation due to instrumentation and operating condition changes.
- n) Reconnect Y2 thermostat wire and remove jumper.

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- 2) If step one does not give the expected results shut unit off. Apply 18 to 28 volt ac to the unloader molded plug leads and listen for a click as the solenoid pulls in. Remove power and listen for another click as the unloader returns to its original position.
- 3) If clicks can't be heard, shut off power and remove the control circuit molded plug from the compressor and measure the unloader coil resistance. The resistance should be 32 to 60 ohms depending on compressor temperature.



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4) Next check the molded plug. Voltage check: Apply control voltage to the plug wires (18 to 28 volt ac). The measured **dc** voltage at the female connectors in the plug should be around 15 to 27 vdc. Resistance check: Measure the resistance from the end of one molded plug lead to either of the two female connectors in the plug. One of the connectors should read close to zero ohms while the other should read infinity. Repeat with other wire. The same female connector as before should read zero while the other connector again reads infinity. Reverse polarity on the ohmmeter leads and repeat. The female connector that read infinity previously should now read close to zero ohms. Replace plug if either of these test methods doesn't show the desired results.